

Board Gender Diversity and Financial Distress Risk: Evidence from Bangladesh

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Abstract

The study aims to find out whether board gender diversity matters in the corporate board and whether it can be valuable for predicting financial distress risk. The data set consists of 370 firm-year observations gathered from DSE-listed manufacturing firms during 2012-2019. The mean value shows the ratio of female directors in Bangladeshi firms is greater than in India but lower compared to other developed countries. Besides, the presence of female directors is greater in FD (financially distressed) firms than in non-FDs during the study period. Logistic regression finds a positive but statistically insignificant influence of BGD on the likelihood of FD. This finding proves the argument placed by other authors about female directors being the victims of tokenism specifically in family firms. Practically, the study will provide exclusive inputs for ensuring gender equality in corporate top management positions and facilitate reforming governance guidelines specific to country and culture relevant.

Keywords: Financial Distress Risk, Board Gender Diversity, Corporate Governance, Altman's Z-score, Logistic Regression, Bangladesh.

1. Introduction

The corporate board plays a crucial role in achieving business goals. The board members are the leaders who take strategic decisions and give necessary direction to their subordinates. Wrong or ineffective decision-making can have disastrous consequences for corporate health. That's why guidelines on corporate governance mechanisms place a great deal of emphasis on effective board formation. Substantial research has been conducted on how board structure and board diversity affect firm performance (Khan *et al.*, 2021; James, 2020; Rahman and Saima, 2018; Yasser *et al.*, 2017). Board diversity denotes the presence of

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people of various ages, gender, nationalities and religions in the corporate board (Dutta and Bose, 2007). Board diversity is perceived to be desirable as diverse backgrounds of the directors mean more expertise, knowledge and viewpoints available to the board (De Cabo *et al.*, 2012).

Board gender diversity is an aspect of overall board diversity and some countries around the world have introduced quotas to include female directors in company boards. For example, in UK and Spain, 40% of board members must be women. Similarly, in India, at least one female director must be a part of every company board (Mamun and Akter, 2021). Yet, women are still underrepresented in the boardroom globally. According to Davies (2011), women's boardroom representation was lowest at 3.6% in the Asia-Pacific and highest at 23% in Sweden.

In Bangladesh, there is no quota or regulatory requirement to appoint women as directors in companies. Despite this, around 18% of board members of the listed public companies in Bangladesh are women, according to the IFC-DSE study report (International Finance Corporation, 2020). However, most of the manufacturing companies are still family-owned (Farooque *et al.*, 2007), and the selection of female directors is grounded on family ties generally, rather than business accomplishments (Muttakin *et al.*, 2012). Therefore, it is important to understand whether this token existence of female directors on the board really adds corporate value.

It is argued that due to different socialization processes, females prefer less risk and are less overconfident than their male counterparts (Barber and Odean, 2001; Srinidhi *et al.*, 2011). Consequently, female presence on the corporate board may lead to a lower risk of financial distress for the company. In the literature, financial distress occurs when the interest expenses of a firm exceed its earnings before interest, taxes, depreciation, and amortization (EBITDA) while the firm's market value falls (Pindado *et al.*, 2008). When a firm falls short of liquid assets and loses its capacity to pay off its short- and long-term debt, it may have the probability of falling into financial distress.

Extensive empirical evidence is available on the relevance of gender diversity in corporate boards and how this influences corporate decisions and in turn corporate financial health. But the findings of those literatures diverge context-wise and hence are inconclusive. Cultural and social dynamics shape an individual's perception and behavior. Thus, the relevance of one corporate governance attribute in one cultural setting may not be applicable or insignificant in a different one.

In Bangladesh, ample research on corporate governance and the impact of its attributes on corporate financial performance has been conducted. To mitigate agency conflict and ensure minority shareholders' interest and sustainable corporate performance, CG guideline has already been implemented and reformed twice by BSEC. However, there is no specific guideline on the gender aspect of board. Similarly, the link between board gender diversity and financial distress risk is hardly explored in Bangladesh. To encourage female participation in every sector of the economy, many measures are being taken place at the policy level. Women's representation can be seen in the corporate board of Bangladeshi firms but in most cases, those are family firms. That's why the study aims to find out whether board gender diversity really matters in the corporate board and can be valuable for predicting financial distress risk in the manufacturing industries of Bangladesh. This will extend the literature on the topic as such research has not been conducted in the context of Bangladesh according to our knowledge. Practically, the study will provide exclusive inputs for ensuring gender equality in corporate top management positions and facilitate reforming governance guidelines specific to country and culture relevant. To measure financial distress probability, Altman's Z-score will be applied. Finally, the link between board gender diversity and financial distress risk will be assessed through logistic regression method.

The remaining parts of the paper are arranged as follows. The relevant literature review along with hypothesis development are presented in section 2; methodology is described in Section 3; results are shown in section 4; discussions are in section-5; and finally, conclusions are given in section 6.

2. Literature Review and Hypothesis Development

2.1 Board Gender Diversity and Financial Distress Risk

Agency theory is the common theoretical ground to understand how board structure can influence the creation of firm value. Agency theory argues that corporate boards hold crucial power to monitor and resolve the conflict between the principals and the agents (Dalton *et al.*, 2007; Dey, 2008). In this case, the monitoring role can be reinforced by increasing board diversity (Brahma *et al.*, 2018). Independent thinking of female directors improves monitoring role and managerial accountability (Adams *et al.*, 2011) which will enhance corporate efficiency. In case of making risky strategic choices, BGD can be beneficial as it creates scope for broader viewpoints and decision-making options (Muller-Kahle and Lewellyn, 2011). Higher ratio of gender diversity in the corporate board

improves performance through effective business supervision and alignment of the risk preference among managers and shareholders (Chen *et al.*, 2019; Wang, 2020), which can reduce the probability of distress risk (Yousaf *et al.*, 2021).

Upper echelons theory, proposed by (Hambrick and Mason, 1984), grounded on the belief that demographic features of the top management team are the key to improving business performance. So, board diversity based on gender, age, education, skills, and tenure can influence the top management decisions that are linked to corporate performance (Mittal and Lavina, 2018).

From the social-psychological viewpoint, female directors tend to take in less risky business decisions (Croson and Gneezy, 2009) and do not show over-confidence compared to their male peers (Huang and Kisgen, 2013). Thus, firms having female directors tend to face less distress risk. On the contrary, Adams and Funk (2012) stated that female directors are not highly power orientated but love risk-taking more than their male peers and so the attendance of women on the board hardly ensures risk-averse decisions. Some authors even argue that corporate boards may become dysfunctional due to BGD (Triana *et al.*, 2014) which begets conflicts in the board (Richard *et al.*, 2004) and thereby hampers the managerial process (Hambrick *et al.*, 1996). Therefore, it is not guaranteed that corporations can always enjoy the fruits of a gender-diversified board. This can also bring negative financial outcome.

Campbell and Mínguez-Vera (2008) pointed out the fact that companies sometimes recruit female directors on ethical grounds. In that case, the female representation in the board becomes the “solos” or “minority” and the females are regarded as “tokens” (Kanter, 1977a; 1977b). First coined by Kanter (1977a), the notion of “tokenism” in the workplace refers to a small group of employees who are recruited especially from a minority group in the society. According to her, token employees generally face high peer pressures and are forced to play a stereotypical role in the workplace. Since women have less representation in the corporate board, they are often the victims of tokenism especially in the least-developed countries. There are several reasons behind this fact. Firstly, female directors are the minority group in the boardroom. Risk alignment may be reduced where the dominance of homogenous male groups prevails over the only one or two female members on the board (Chen *et al.*, 2019). Secondly, patriarchal system does not let women to establish their opinions strongly and they are often unheard. Thirdly, the educational background and business expertise of females in the least- developed countries is not as strong as that of males (Muttakin *et al.*, 2015). Fourthly, females may be appointed just to fill up the female quotas fixed by legislators in some countries with weak legal and institutional structure. Gull *et al.* (2017) stated that female directors who are in

the board just as space fillers cannot be expected to reduce earning management. That's why even in a gender-diverse board, group dynamics may deter the minority groups from influencing the board (Westphal and Milton, 2000).

However, a greater fraction of female directors can be seen in the family-controlled firms (Darmadi, 2013) where the sponsors/directors/majority shareholders can influence the appointment of board of directors (Rashid *et al.*, 2010). So, we cannot ignore the possibility of appointing female directors for keeping the family control intact (Brahma *et al.*, 2018) rather than empowering them in genuine sense. If the firms do not employ the directors based on their qualities and capabilities, they may hurt the economic outcome in the end (Campbell and Mínguez-Vera, 2008).

Earlier studies found mixed results regarding the influence of BGD on the probability of FD (financial distress) risk. For example- Some authors noted that board gender diversity can significantly reduce the distress probability in different country contexts (García and Herrero, 2021; Kristanti *et al.*, 2016; Yousaf *et al.*, 2021). Whereas Chen *et al.*, (2019) found a significant positive association of BGD with financial risk. Conversely, Salloum *et al.* (2013) found an insignificant positive effect of female directors on the distress probability in the Lebanese family-owned business firms. In the Indian context, Mittal and Lavina (2018) also reported insignificant negative impact of all categories, except one, of female representation variables on the distress probability. Overall, they concluded gender diversity can mitigate distress risk. In the context of Bangladesh, Rahman (2016) stated that female directors often do not play a noteworthy role in the corporate board meeting. Rahman and Saima (2018) failed to find a significant relationship between independent directors, female directors, and corporate performance. Similarly, Wang (2020) found no positive effect of gender diversity on corporate governance and performance. From the above discussions, it cannot be inferred how exactly board gender diversity can influence the distress probability. So, we have developed the hypothesis as follows:

H_A: Board gender diversity has an impact on financial distress risk.

3. Research Methodology

3.1 Sample Selection

The sample of this study comprises of the publicly listed manufacturing firms in Dhaka Stock Exchange (DSE), Bangladesh. Financial, service, and miscellaneous industries are not considered. There are two reasons for selecting only the DSE

listed companies; (1) the financial and governance-related data of these firms can be easily accessible from the websites and (2) these firms must maintain the corporate governance guidelines (CG) and other regulations set by the Bangladesh Securities and Exchange Commission (BSEC). The study period is selected from 2012 to 2019 as within this time CG guidelines have been reformed twice. The first CG guideline in Bangladesh was issued in 2006; it was revised in 2012 and a recent one was issued in 2018 (Bala, 2018). So, this time is crucial to examine the influence of any governance variable. To construct the sample, a specific procedure is followed. Firstly, newly listed firms having only one or no annual reports and firms with missing values on financial and governance data have been excluded. So, firms in Jute and Paper and printing industries are not taken. Secondly, the sample is divided into two groups- firms in financial distress (FD) and non-FD as per the criteria set. According to Altman (1968) Z-score <1.81 , $1.81 < \text{Z-score} < 2.99$, and Z-score >2.99 can be regarded as distress, gray and safe zone respectively. In this study, firms either in gray or distress zone are taken as FD (Yousaf *et al.*, 2021). Thus, firms with an Altman's Z-score below 1.81 have been considered as FD, and firms with an Altman's Z-score above 1.81 as non-FD firms (Shahwan, 2015; Younas *et al.*, 2021). Then, the non-FD firms have been selected randomly from each industry, making sure the number of non-FD firms is not less than that of FD (Yousaf *et al.*, 2021). As a result, 12 FD firms from the textile industry have been removed from the initial sample. Additionally, the entire sample of the food industry has been excluded as no sample food firm is in financial distress. Finally, the sample of the study resulted in an unbalanced panel data set of total 370 firm-year observations of 55 firms over the study period. Out of 370 firm-year observations, 118 (32%) firm-year observations are of FD firms and 252(68%) are of non-FD firms (see Table-1: Panel-B). A detailed population and sample distribution on a yearly basis have been presented in Table-1.

3.2 Measurement of Variables and Data Source

Altman's (1968) Z-score is calculated to detect FD risk in the manufacturing firms in Bangladesh. Firms with Z-score <1.81 , $1.81 < \text{Z-score} < 2.99$, and Z-score >2.99 can be regarded as distress, gray and safe zone respectively. So, based on the values of Z-score, sample firms are separated into two groups- FD firms and non-FD firms. A firm is considered in distress risk if the Z-score is below 1.81 and not in distress risk if the score is above 1.81. Then, a dummy value of "1" is set for the FD firms and "0" for the non-FD firms.

Table 1 : Distribution of the Population and the Sample Firms

		Initial Sample																		
	Listed Manufacturing Firms in DSE	2012		2013		2014		2015		2016		2017		2018		2019				
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Textile	58	29	8	17	11	20	12	20	9	19	8	20	12	19	12	19	10	18		
Pharmaceuticals & Chemicals	32	16	6	13	7	13	8	13	4	8	2	5	9	15	9	14	9	16		
Food & Allied	20	10	5	11	6	11	9	15	8	17	8	20	9	15	9	14	9	16		
Cement	7	3	5	11	6	11	6	10	4	8	5	13	6	10	6	10	6	11		
Ceramic	5	2	4	9	4	7	4	7	3	6	3	8	4	6	4	6	4	7		
Tannery	6	3	2	4	2	4	2	3	2	4	3	8	3	5	3	5	3	5		
Fuel & Power	23	11	7	15	8	15	9	15	8	17	6	15	8	13	9	14	5	9		
Engineering	42	21	10	21	11	20	11	18	10	21	5	13	11	18	11	17	11	19		
Paper & Printing	6	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Jute	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total	202	100	47	100	55	100	61	100	48	100	40	100	62	100	63	100	57	100		
Panel-B: Final Sample Distribution by Years		2012		2013		2014		2015		2016		2017		2018		2019		Total		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Non-distress	31	74	35	71	40	77	29	73	25	78	36	68	31	57	25	52	252	68		
Distress	11	26	14	29	12	23	11	28	7	22	17	32	23	43	23	48	118	32		
	42	100	49	100	52	100	40	100	32	100	53	100	54	100	48	100	370	100		

Source: Generated by Authors

Note: Data about the number of listed firms in DSE have been retrieved from (Sector wise Company List | Dhaka Stock Exchange (dsebd.org))

Two different proxy measures- BGD1 and BGD2 have been used to find out the impact of the main variable of interest –BGD on FD risk. Earlier studies have used several proxy measures to account for gender diversity in the corporate board room. Following Chen *et al.* (2019), the study has taken two different alternate measures of BGD to check the consistency of the results. Besides, this study has incorporated different board and firm characteristics as control variables into the model. Control variables help to increase the internal validity of the study by segregating the impact of other extraneous factors on the dependent variable (García and Herrero, 2021). Firstly, control variables related to board characteristics are board size (BS) and board independence (BIND). Previously, authors placed contrasting arguments regarding the effect of BS on FD. For example, Manzaneque *et al.* (2016) argued that a large board is equipped with substantial knowledge and skills that contribute to reducing distress risk. García and Herrero (2021) opposed that a large board may face a lack of coordination, which can distort decision-making in crisis moments. From the agency point of view, BIND is crucial to ensure transparency and reduce opportunistic behaviors of the directors during corporate failure. Salloum *et al.* (2013) stated that FD is less in the firms with higher BIND. Finally, a few firm characteristics such as profitability ratio, solvency ratio and firm size have been considered as these are the core financial factors to ensure financial stability of the firms. Two separate variables- ROA and Tobin's Q have been used to account for profitability from accounting and market point of view respectively (Adams and Ferreira, 2009). Firms with higher profitability, less leverage ratio and larger size are considered less risky as they have a strong financial base to tackle the distress situation (Kristanti *et al.*, 2016; Younas *et al.*, 2021). Table-2 represents the list of the variables used in the study.

Collecting data for a quantitative study in the context of Bangladesh is a tedious job. As a composite database, as in other developed and developing countries, is hardly available in Bangladesh, researchers need to collect and extract the data manually. So, the reliability and accuracy of the data set comes into question. To mitigate this problem, the data for the study are collected by one author and checked by another. Data for calculating Altman's Z-score, BGD and other control variables are assembled from the annual reports of the respective companies. Due to unavailability in the annual reports, market prices of a few firms are taken from the DSE library. All the annual reports are gathered from the individual websites of the companies.

Table 2 : List of Variables

Name of Variables	Definition	Sources
Dependent Variable:		
Financial Distress (FD)	FD risk measured by Altman Z-score takes a dummy variable “1” if the Z-score is below 1.81 and “0” otherwise.*	García and Herrero (2021); Salloum <i>et al.</i> (2013); Shahwan (2015).
Main variable:		
Board Gender Diversity (BGD):		
BGD 1	Calculated as the ratio of female directors in relation to the total board of directors	Chen <i>et al.</i> (2019); Kristanti <i>et al.</i> (2016); Manzaneque <i>et al.</i> (2016); García and Herrero (2021);Mittal and Lavina (2018)
BGD2	Measured by taking dummy variable “1” if there is any female director on the board and “0” otherwise.	Chen <i>et al.</i> , (2019); Salloum <i>et al.</i> (2013); Yousaf <i>et al.</i> (2021);
Control variables:		Other Board Characteristics
Board Size (BS)	Measured by the total number of board of directors	Brahma <i>et al.</i> (2018); Cardillo <i>et al.</i> (2021); García and Herrero (2021); Younas <i>et al.</i> (2021)
Board Independence (BIND)	Calculated as the ratio of independent directors in relation to the total board of directors	Cardillo <i>et al.</i> (2021); García and Herrero (2021); Manzaneque, <i>et al.</i> (2016)

Control variables:	Firm-specific Characteristics	
Profitability Ratio:	Firm ROA and Tobin's Q are taken as a proxy measure of firm profitability.	
Return on Assets (ROA)	Calculated as net profit before tax divided by the total assets	Brahma <i>et al.</i> (2018); Cardillo <i>et al.</i> (2021); García and Herrero (2021); Manzanque <i>et al.</i> (2016).
Tobin's Q	Calculated as dividing the book value of total liability plus the market value of common equity by the book value of total assets	Brahma <i>et al.</i> (2018); Cardillo <i>et al.</i> (2021); Wang (2020)
Solvency Ratio:	Firm leverage ratio is taken as a proxy measure of firm solvency.	
Leverage (LEVG)	Calculated as book value total debt divided by book value of total assets	Brahma <i>et al.</i> (2018); García and Herrero (2021)
Firm Size (SIZE)	Firm size is measured by taking the logarithm of total assets.	Cardillo <i>et al.</i> (2021); García and Herrero (2021); Younas <i>et al.</i> (2021)

3.3 Analysis Methods

Logistic regression method is applied to analyze how the explanatory variables affect the risk of FD. It expresses the probability of being at FD risk in terms of odds ratio. The study assigned a binary value of 1 to the firms suffering from FD risk and 0 to those not in FD risk. According to Manzanque *et al.* (2016) and Pindado *et al.* (2008), when the outcome variable of a study is dichotomous, logistic regression is better to be used to get over the restrictions of ordinary least squares estimate. It also does not assume normality and homoscedasticity pattern

of data distribution (García and Herrero, 2021). Other empirical studies on FD such as (Kristanti *et al.*, 2016; Mittal and Lavina, 2018; Salloum *et al.*, 2013; Shahwan, 2015) also adopted this analysis method. Thus, the research model for the study is developed as follows-

$$\text{Log}\left(\frac{\text{Prob}(\text{FD})}{\text{Prob}(\text{NonFD})}\right) = \alpha_0 + \sum \beta_j \text{BGD}_{jit} + \sum \gamma_j \text{CV}_{jit} + \psi_t + \eta_i + \varepsilon_{it} \dots \dots \dots (1)$$

Where subscripts j , i , t denote the number of explanatory variables ($j=1, 2, \dots, m$), each cross-sectional unit ($i=1, 2, \dots, N$), and time period ($t=1, 2, \dots, T$) respectively. α , β and γ are the coefficients for the explanatory variables. BGD denotes two alternative proxy measures of board gender diversity – (BGD1) the ratio of female directors on the board and (BGD2) a dummy value of “1” for female presence on the board and “0” otherwise. CV stands for control variables- Other board characteristics (BS, BI); Firm-specific Characteristics- Profitability ratios (ROA, Tobin's Q), Solvency ratio (LEVG), and Firm size (SIZE). Finally, to account for time effects and industry-specific effects, ψ_t, η_i are added respectively. ε_{it} denotes disturbance term. Additionally, robust standard errors clustered by firm were computed to avoid underestimation of the standard errors (Petersen, 2009; García and Herrero, 2021).

4. Results

4.1 Summary Statistics

Table-3 presents the summary statistics results. It shows that mean ratio of female directors on the board (BGD1) is 14.71% with a minimum of no female directors and a maximum of 50% female directors in the manufacturing industries of Bangladesh. This indicates the presence of female directors in Bangladeshi firms is greater than that of India where the mean ratio is 9.06% to maximum of 28.57% (Mittal and Lavina, 2018) and almost comparable to Chinese firms' mean female directors' ratio (14.50% to maximum 55.60%) (Bin Khidmat *et al.*, 2020). But the ratio is still low compared to other developed countries (Brahma *et al.*, 2018; García and Herrero, 2021). Besides, BGD2 shows the presence of female directors is greater in FD firms than in non-FDs throughout the study period. Presence of female directors is detected in 38.38% of the total observations.

Table-3: Summary Statistics

Variables	Observation	Mean	Std. Dev.	Min	Max			
FD	370	0.3189189	0.4666886	0	1			
BGD1	370	0.1470541	0.1416558	0	0.5			
BS	370	7.802703	2.508845	4	19			
BIND	370	0.248973	0.0894429	0	0.71			
ROA	370	0.0801892	0.0876227	-0.12	0.6			
Tobin's Q	370	2.166919	2.175567	0.30	19.97			
LEVG	370	0.4971081	0.2026505	0.01	0.91			
SIZE	370	1.56e+10	2.82e+10	1.55e+08	2.46e+11			
FD vs non-FD								
			FD		non-FD		Total	
			N	%	N	%	N	%
BGD2	No Female Directors		39	33.05	103	40.87	142	38.38
	Female Directors		79	66.95	149	59.13	228	61.62
Total			118	100	252	100	370	100

Figure-1 shows inconsistent ups and downs annually in the average ratio of female directors. However, in the final three years of the study duration, the ratio remains static. Figure -2 shows the industry-wise average ratio of female directors. Textile industry has the highest ratio of BGD followed by Pharmaceuticals and Engineering industries.

Mean board size is 7.80 out of which 24.90% are independent directors. Negative minimum ROA and Tobin's Q > 1 indicate the existence of poor-performing firm and mean profitability ratio is 8.02% and 2.17 respectively. There are firms holding high (91%) to low (1%) leverage and mean firm size is 1.56e+10.

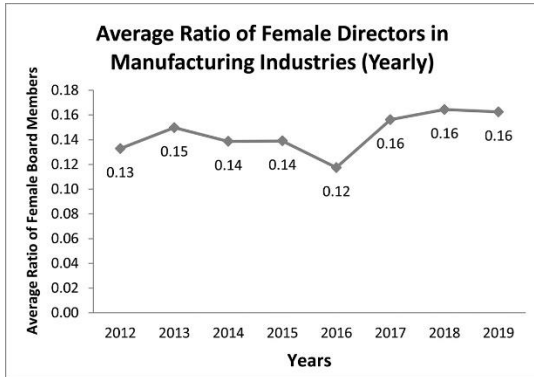


Figure-1: Yearly Representation of the Average Ratio of Female Directors in Manufacturing Industries

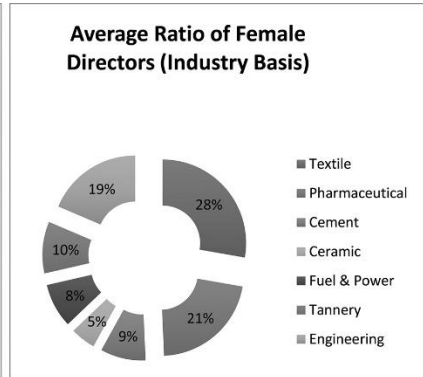


Figure-2: Average Ratio of Female Directors by Industry Types

4.2 Correlation Matrix and Mean Difference Test

Table-4 presents the pairwise correlation matrix. It shows FD is positively related to BGD variables, LEVG, and SIZE and negatively related to other variables. It also confirms presence of no multicollinearity problem in the relationship between two explanatory variables. The coefficient values are less than 0.80 prescribed by (Gujarati, 1995; Hair *et al.*, 2010). Only the two proxies of BGD are highly correlated. This does not cause any problem in the regression analysis as these proxies are used alternatively. Table-5 shows the significant mean difference test between FD and non-FD firms. Comparison of board characteristics variables between FD and non-FD firms shows that FD firms have a greater ratio and presence of female directors but slightly lower board size and independent directors. This indicates the presence of female directors may increase the likelihood of FD risk. However, the t-test statistic proves only the mean difference of BGD1 is significant at 10%.

As the results of mean difference t-test in two categories of BGD are contradictory, logistic regression analysis has been performed further to confirm the relationship between BGD and FD.

Table-4: Pairwise Correlation Matrix

Variables	FD	BGD1	BGD2	BS	BIND	ROA	Tobin's Q	LEVG	SIZE
FD	1								
BGD1	0.1007**	1							
BGD2	0.0750	0.8204***	1						
BS	-0.0572	-0.0440	0.0865	1					
BIND	-0.0389	0.1157**	0.0973*	-0.2353***	1				
ROA	-0.3998***	-0.0142	0.1211**	0.0491	0.0931*	1			
Tobin's Q	-0.3149***	-0.0523	-0.0394	-0.0242	0.0612	0.5170***	1		
LEVG	0.4525***	-0.0629	-0.1219**	-0.0876	-0.0448	-0.2321***	-0.0384	1	
SIZE	0.0979*	-0.1581***	-0.0644	0.3871***	-0.1520***	0.0422	-0.2715***	-0.0692	1

Note: ***, **, and * indicate significant at 1%, 5%, and 10% respectively.

Table-5: Sample Mean Difference Test

	Observation	BGD1	BGD2	BS	BIND
Non-FD	252	0.1373016	0.5912698	7.900794	0.2513492
FD	118	0.1678814	0.6694915	7.59322	0.2438983
Difference		-0.0305798*	-0.0782217	0.3075733	0.0074509
(P-Value)		(0.0528)	(0.1501)	(0.2723)	(0.4559)

Note: ***, **, and * indicate significant at 1%, 5%, and 10% respectively.

4.3 Results of Logistic Regression

Logistic regression analysis is applied in the study to find out how BGD affects the FD risk. This section presents the results of that analysis which explains the relevance of BGD and other control variables in predicting the likelihood of FD risk in the context of Bangladesh. Total four models have been presented in Table-6. Model-1 shows the influence of the main variable of interest (BGD1) and control variables (BS, BIND, ROA, LEVG, and SIZE). Model-2 is like Model-1 except control variable (Tobin's Q) is used as an alternative to ROA. Model-3 includes another alternate proxy of BGD (BGD2) and control variables (BS, BIND, ROA, LEVG, and SIZE). Again, in Model-4, control variable (Tobin's Q) is used instead of ROA and everything else is like Model-3. The reason for using alternative proxy variables is to check the consistency of the results.

The results show BGD has no statistically significant influence in predicting the likelihood of being in financial distress. However, the relationship is positive between BGD variables and FD. Only Model-1 shows a negative effect of BGD1 on FD. This indicates that a gender-diversified board does not predict distress risk in Bangladeshi manufacturing firms. Thus, the study does not support the proposed hypothesis.

Additionally, the regression results show positive but no significant effect of other board characteristics that are used as control variables. So, having greater board size and board independence does not reduce distress risk of the manufacturing firms in Bangladesh. But, the firm characteristics are highly significant in predicting the distress probability. Higher profitability, lower leverage, and small-sized firms will likely experience less distress risk.

Table-6: Results of Logistic Regression Analysis

	Dependent Variable: FD			
Explanatory Variables	Model-1	Model-2	Model-3	Model-4
BGD:				
BGD1	-0.4292208 (0.875)	1.745947 (0.538)	-	-
BGD2	-	-	0.4882153 (0.483)	0.708088 (0.430)
BS	0.018867 (0.915)	0.0635899 (0.708)	-0.0149532 (0.932)	0.0564473 (0.725)
BIND	2.222821 (0.553)	1.564449 (0.641)	1.488211 (0.680)	1.415978 (0.668)
ROA	-32.09524*** (0.000)	-	- 32.20589*** (0.000)	-
Tobin's Q	-	-4.319312*** (0.004)	-	- 4.300478*** (0.004)
LEVG	6.864356*** (0.000)	11.85553*** (0.000)	6.790432*** (0.000)	12.01075 *** (0.000)
SIZE	0.6218398*** (0.006)	-0.1729558 (0.539)	0.608811*** (0.010)	-0.1842821 (0.514)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Robust	Yes	Yes	Yes	Yes
Observations	370	370	370	370
Wald chi2 (19)	63.59 (0.0000)	61.18 (0.0000)	74.68 (0.0000)	76.42 (0.0000)
Pseudo R ²	0.4452	0.5606	0.4487	0.5634

Note: ***, **, and * indicate significant at 1%, 5%, and 10% respectively.

5. Discussions

In Bangladesh, much literature is available on corporate governance and the impact of its attributes on corporate performance. To mitigate agency conflict, ensuring minority shareholders' interest and sustainable corporate performance, CG guideline has been implemented and already reformed twice by BSEC. However, there is no specific guideline on the gender aspect of board. Similarly,

the link between board gender diversity and financial distress risk is hardly explored in Bangladesh. To encourage female participation in every sector of the economy, many measures are being taken place at the policy level. Women's representation can be seen in the corporate board of Bangladeshi firms but in most cases, those are family firms. That's why the study aims to find out whether board gender diversity really matters in the corporate board and can be valuable for forecasting financial distress risk in the manufacturing industries of Bangladesh. The study finds the presence of female directors is greater in FD firms than in non-FDs during the study period.

Logistic regression results reveal that the board gender diversity has positive but no statistically significant effect on the likelihood of financial distress risk. So, board gender diversity does not add much value in reducing distress likelihood unlike the prediction of previous studies in different country contexts. Rather the presence of female directors weakens the corporate board in the context of Bangladesh. The reason for the insignificant effect might be the selection of female directors based on family connection or kinship or the minimal representation on the corporate board. González *et al.* (2020) concluded that in a weak institutional and legal context, allotting the seats of the corporate board to the female directors from family members is primarily based on nepotism and dynastic management rather than meritocracy. To retain family legacy and exercise family control in the board (Bertrand and Schoar, 2006; Gómez-Mejía *et al.*, 2007; Brahma *et al.*, 2018), maximum female directors are assigned based on family ties (Fariha *et al.*, 2021) instead of filling the board positions by qualified members. That's why a few female directors, from outside family members, are observed on Bangladeshi corporate boards. Generally, disregarding the business qualification, female directors in Bangladeshi family firms are selected from the relatives of CEO, sponsors, and majority shareholders (Muttakin *et al.*, 2012; Rahman, 2016). Hence, instead of adding value, the female directors become a token or showpiece in a male-controlled board. The findings are in line with (Mittal and Lavina, 2018; Salloum *et al.*, 2013). The findings of this study support the view of Brahma *et al.* (2018) that mere female representation on the board cannot be expected to improve firm performance and reduce the distress risk probability consequently. So, the insignificant influence of board gender diversity proves the argument of the token theory discussed from a socio-psychological perspective. Appointment of female directors' is just showing a rosy picture of women participation in the top management which ultimately adds no economic output for the firms in Bangladesh, where the patriarchal system still prevails.

But, our findings contradict most of the previous studies (García and Herrero, 2021; Kristanti *et al.*, 2016; Yousaf *et al.*, 2021) who found board gender diversity can significantly reduce the distress probability. Overall, we rebuttal the arguments of those studies that higher board size, board independence and female representation can be beneficial in an emerging country context such as Bangladesh as the study found no significant influence of any board characteristic on distress risk. This raises doubt on the effectiveness of board composition in ensuring good corporate governance and financial stability in a weak institutional and cultural setting. Finally, similar to other studies (García and Herrero, 2021; Kristanti *et al.*, 2016; Manzanque *et al.*, 2016; Younas *et al.*, 2021), the statistical significance of firm characteristics (i.e., profitability, leverage ratios and firm size) in predicting firm distress risk manifests the importance of strengthening the core financial aspects of a firm.

5.1 Implications

This study adds value to the previous literature, especially in the context of Bangladesh. As per the authors' information, this is the first study linking BGD with financial distress in Bangladeshi manufacturing industries. In this regard, it is a unique contextual contribution. Findings of the study will also supplement the previous literature existing on emerging country contexts. It will facilitate conducting a comparative study. Moreover, this study shows no impact of board characteristics on reducing financial distress which raises the doubt on the implication of guidelines on the governance attributes. Practically, the study will help policymakers and regulators to formulate guidelines specific to country and culture relevant.

5.2 Limitations

The scope of the study is limited to only a few aspects of board characteristics. Other corporate governance characteristics may have important implications in predicting distress probability. Besides, board gender diversity is only measured by two proxy variables. According to critical mass theory, two or more female members can exert significant influence and knockdown tokenism (Kanter, 1977a; 1977b). So, it will be interesting to see whether distress risk differs in the case of two or more female directors instead of one. Additionally, impact of gender role considering age, educational qualification, experience, job tenure, and job position/designation can be assessed further. Moreover, the study does not consider the endogeneity issue that might exist between board gender diversity and other explanatory variables. Future studies can address these issues and apply any other econometrics technique to check the consistency of the findings.

6. Conclusions

The study aims to find out whether board gender diversity really matters in the corporate board and can be valuable for predicting financial distress risk in the manufacturing industries of Bangladesh. The mean value shows ratio of female directors in Bangladeshi firms is greater than in India but lower compared to other developed countries. Besides, the presence of female directors was greater in FD firms than in non-FDs during the study period. Logistic regression results show gender diversified board does not significantly predict the likelihood of financial distress risk. However, the relationship is positive between board gender diversity variables and financial distress. So, the presence of female directors weakens the board. The insignificant effect of board gender diversity proves the argument of the token theory discussed from a socio-psychological perspective. The reason for the insignificant effect might be the selection of female directors based on family connection or kinship or the minimal representation on the corporate board.

References

- Adams, R.B. and Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of financial economics*, 94(2), pp.291-309. Available at: <https://doi.org/10.1016/j.jfineco.2008.10.007>
- Adams, R.B. and Funk, P. (2012). Beyond the glass ceiling: Does gender matter? *Management science*, 58(2), pp.219-235. Available at: <https://doi.org/10.1287/mnsc.1110.1452>
- Adams, R., Nowland, J., and Grey, S. (2011). Does gender matter in the boardroom? Evidence from the market reaction to mandatory new director announcements. *University of New South Wales Working Paper*. Available at: <https://dx.doi.org/10.2139/ssrn.1953152>
- Altman, E.I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The Journal of Finance*, 23 (4), pp. 589-609.
- Bala, S.K. (2018). Corporate governance code 2018 in Bangladesh: Reforms and revisions. *Monthly Review (June 2018)*, pp.24-35. Available at SSRN: <https://ssrn.com/abstract=3215264>
- Barber, B.M. and Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics*, 116(1), pp.261-292. Available at: <https://doi.org/10.1162/003355301556400>

- Bertrand, M. and Schoar, A. (2006). The role of family in family firms. *Journal of economic perspectives*, 20(2), pp.73-96. Available at: DOI: 10.1257/jep.20.2.73
- Bin Khidmat, W., Ayub Khan, M. and Ullah, H. (2020). The Effect of Board Diversity on Firm Performance: Evidence from Chinese Listed Companies. *Indian Journal of Corporate Governance*, 13(1), pp.9-33. Available at: <https://doi.org/10.1177/0974686220923793>
- Brahma, S., Nwafor, C. and Boateng, A. (2021). Board gender diversity and firm performance: The UK evidence. *International Journal of Finance & Economics*, 26(4), pp. 5704-5719.
- Campbell, K., and Mínguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, 83(3), pp. 435–451. Available at: <https://doi.org/10.1007/s10551-007-9630-y>
- Cardillo, G., Onali, E. and Torluccio, G. (2021). Does gender diversity on banks' boards matter? Evidence from public bailouts. *Journal of Corporate Finance*, 71, pp.101560. Available at: <https://doi.org/10.1016/j.jcorpfin.2020.101560>
- Chen, L.H., Gramlich, J. and Houser, K.A. (2019). The effects of board gender diversity on a firm's risk strategies. *Accounting & Finance*, 59(2), pp.991-1031. Available at: <https://doi.org/10.1111/acfi.12283>
- Croson, R., and Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, 47(2), pp. 448–474. Available at: <https://doi.org/10.1257/jel.47.2.448>
- Dalton, D.R., Hitt, M.A., Certo, S.T. and Dalton, C.M. (2007). The fundamental agency problem and its mitigation: independence, equity, and the market for corporate control. *Academy of management annals*, 1(1), pp.1-64. Available at: <https://doi.org/10.5465/078559806>
- Darmadi, S. (2013). Do women in top management affect firm performance? Evidence from Indonesia. *Corporate Governance*, 13 (3), pp. 288–304. Available at: <https://doi.org/10.1108/CG-12-2010-0096>
- Davies, J.S. (2011). *Challenging governance theory: From networks to hegemony*. Policy Press.
- De Cabo, R.M., Gimeno, R. and Nieto, M.J. (2012). Gender diversity on European banks' boards of directors. *Journal of Business Ethics*, 109(2), pp.145-162. Available at: <https://doi.org/10.1007/s10551-011-1112-6>
- Dey, A. (2008). Corporate governance and agency conflicts. *Journal of accounting research*, 46(5), pp.1143-1181. Available at: <https://doi.org/10.1111/j.1475-679X.2008.00301.x>

- Dutta, P. and Bose, S. (2006). Gender Diversity in the Boardroom and Financial Performance of Commercial Banks: Evidence from Bangladesh. *The Cost and Management*, 34(6), pp.70-74. Available at SSRN: <https://ssrn.com/abstract=1029041>
- Fariha, R., Hossain, M.M. and Ghosh, R. (2021). Board characteristics, audit committee attributes and firm performance: empirical evidence from emerging economy. *Asian Journal of Accounting Research*, 7(1). Available at: <https://doi.org/10.1108/AJAR-11-2020-0115>
- Farooque, O.A., Van Zijl, T., Dunstan, K. and Akm, W.K. (2007). Corporate governance in Bangladesh: Link between ownership and financial performance. *Corporate Governance: An International Review*, 15(6), pp.1453-1468. Available at: <https://doi.org/10.1111/j.1467-8683.2007.00657.x>
- García, C.J. and Herrero, B. (2021). Female directors, capital structure, and financial distress. *Journal of Business Research*, 136, pp.592-601. Available at: <https://doi.org/10.1016/j.jbusres.2021.07.061>
- Gómez-Mejía, L.R., Haynes, K.T., Núñez-Nickel, M., Jacobson, K.J. and Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative science quarterly*, 52(1), pp.106-137. Available at: <https://doi.org/10.2189%2Fasqu.52.1.106>
- González, M., Guzmán, A., Pablo, E. and Trujillo, M.A. (2020). Does gender really matter in the boardroom? Evidence from closely held family firms. *Review of Managerial Science*, 14(1), pp.221-267. Available at: <https://doi.org/10.1007/s11846-018-0292-1>
- Gull, A.A., Nekhili, M., Nagati, H. and Chtioui, T., 2018. Beyond gender diversity: How specific attributes of female directors affect earnings management. *The British Accounting Review*, 50(3), pp.255-274. Available at: <https://doi.org/10.1016/j.bar.2017.09.001>
- Hair, J. F., Jr, Black, J. W., Babin, B. J., and Anderson, E. R. (2010). *Multivariate data Analysis* (7th ed.). Edinburgh: Pearson Education Limited.
- Hambrick, D.C., Cho, T.S. and Chen, M.J. (1996). The influence of top management team heterogeneity on firms' competitive moves. *Administrative science quarterly*, 41(4), pp.659-684. Available at: <https://doi.org/10.2307/2393871>

- Hambrick, D.C. and Mason, P.A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of management review*, 9(2), pp.193-206. Available at: <https://doi.org/10.5465/amr.1984.4277628>
- Huang, J., and Kisgen, D. J. (2013). Gender and corporate finance: Are male executives overconfident relative to female executives? *Journal of Financial Economics*, 108(3), pp. 822–839. Available at: <https://doi.org/10.1016/j.jfineco.2012.12.005>
- International Finance Corporation, (2020). Portrait of Bangladesh's Independent Directors. Available at: https://www.ifc.org/wps/wcm/connect/88bd29f9-5a98-4ede-a170-616741c123b/6/Bangladesh+Independent+Director+Profile_Final.pdf?MOD=AJPERES&CVID=na.EP41
- James, P.C. (2020). Understanding the Impact of Board Structure on Firm Performance: A Comprehensive Literature Review. *International Journal of Business and Social Research*, 10(1), pp.1-12. Available at: <https://ideas.repec.org/a/lrc/larijb/v10y2020i1p1-12.html>
- Kanter, R. (1977a). *Men and women of the corporation*. New York: Basic Books.
- Kanter, R. M. (1977b). Some effects of proportions on group life: Skewed sex ratios and responses to token women. *American Journal of Sociology*, 82(5), pp.965–990. Available at: <https://www.journals.uchicago.edu/doi/abs/10.1086/226425>
- Khan, M.T., Al-Jabri, Q.M. and Saif, N. (2021). Dynamic relationship between corporate board structure and firm performance: Evidence from Malaysia. *International Journal of Finance & Economics*, 26(1), pp.644-661. Available at: <https://doi.org/10.1002/ijfe.1808>
- Kristanti, F.T., Rahayu, S., and Huda, A.N. (2016). The determinant of financial distress on Indonesian family firm. *Procedia-Social and Behavioral Sciences*, 219, pp.440-447. Available at: <https://doi.org/10.1016/j.sbspro.2016.05.018>
- Mamun, S.A and Aktar, A (2021). Taking women on board: Corporate Governance Practices in Bangladesh. *The Financial Express*, 3 April. Available at: <https://thefinancialexpress.com.bd/views/taking-women-on-board-1617387504>
- Manzanaque, M., Priego, A.M. and Merino, E. (2016). Corporate governance effect on financial distress likelihood: Evidence from Spain. *Revista de Contabilidad*, 19(1), pp.111-121. Available at: <https://doi.org/10.1016/j.rcsar.2015.04.001>

- Mittal, S. and Lavina (2018). Females' representation in the boardroom and their impact on financial distress: an evidence from family businesses in India. *Indian Journal of Corporate Governance*, 11(1), pp.35-44. Available at: <https://doi.org/10.1177%2F0974686218763857>
- Muller-Kahle, M. I., and Lewellyn, K.B. (2011). Did board configuration matter? The case of US subprime lenders. *Corporate Governance: An International Review*, 19 (5), pp. 405-417. Available at: <https://doi.org/10.1111/j.1467-8683.2011.00871.x>
- Muttakin, M.B., Khan, A. and Subramaniam, N. (2012). Board structure and firm performance: Evidence from an emerging economy. *Academy of Taiwan Business Management Review*, 8(2). Available at SSRN: <https://ssrn.com/abstract=2155231>
- Muttakin, M.B., Khan, A. and Subramaniam, N. (2015). Firm characteristics, board diversity and corporate social responsibility: evidence from Bangladesh, *Pacific accounting review*, 27(3), pp. 353-372. Available at: <http://hdl.handle.net/10536/DRO/DU:30074268>
- Petersen, M.A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *The Review of financial studies*, 22(1), pp.435-480. Available at: <https://doi.org/10.1093/rfs/hhn053>
- Pindado, J., Rodrigues, L. and de la Torre, C. (2008). Estimating financial distress likelihood. *Journal of Business Research*, 61(9), pp.995-1003. Available at: <https://doi.org/10.1016/j.jbusres.2007.10.006>
- Rahman, M. M. (2016). Determinants of CEO compensation: Empirical evidence from listed banks of Bangladesh. *Dhaka University Journal of Business Studies*, 1(1), pp. 127-161.
- Rahman, M.M. and Saima, F.N. (2018). Efficiency of board composition on firm performance: Empirical evidence from listed manufacturing firms of Bangladesh. *The Journal of Asian Finance, Economics, and Business*, 5(2), pp.53-61. Available at: <https://doi.org/10.13106/jafeb.2018.vol5.no2.53>
- Rashid, A., De Zoysa, A., Lodh, S. and Rudkin, K. (2010). Board composition and firm performance: Evidence from Bangladesh. *Australasian Accounting, Business and Finance Journal*, 4(1), pp.76-95. Available at: <http://dx.doi.org/10.14453/aabfj.v4i3.8>
- Richard, O. C., Barnett, T., Dwyer, S. and Chadwick, k. (2004). Cultural Diversity in Management, Firm Performance, and the Moderating Role of Entrepreneurial Orientation Dimensions. *Academy of Management*

Journal, 47(2), pp. 255–266. Available at: <https://doi.org/10.5465/20159576>

- Salloum, C.C., Azoury, N.M. and Azzi, T.M. (2013). Board of directors' effects on financial distress evidence of family owned businesses in Lebanon. *International Entrepreneurship and Management Journal*, 9(1), pp.59-75. Available at: <https://doi.org/10.1007/s11365-011-0209-9>
- Shahwan, T. M. (2015). The Effects of Corporate Governance on Financial Performance and Financial Distress: Evidence from Egypt. *Corporate Governance: The International Journal of Business in Society*, 15(5). Available at: <http://dx.doi.org/10.1108/CG-11-2014-0140>
- Srinidhi, B.I.N., Gul, F.A. and Tsui, J. (2011). Female directors and earnings quality. *Contemporary accounting research*, 28(5), pp.1610-1644. Available at: <https://doi.org/10.1111/j.1911-3846.2011.01071.x>
- Triana, M.D.C., Miller, T.L. and Trzebiatowski, T.M. (2014). The double-edged nature of board gender diversity: Diversity, firm performance, and the power of women directors as predictors of strategic change. *Organization Science*, 25(2), pp.609-632. Available at: <https://doi.org/10.1287/orsc.2013.0842>
- Wang, Y.H. (2020). Does board gender diversity bring better financial and governance performances? An empirical investigation of cases in Taiwan. *Sustainability*, 12(8), p.3205. Available at: <https://doi.org/10.3390/su12083205>
- Westphal, J. D., and Milton, L. P. (2000). How experience and network ties affect the influence of demographic minorities on corporate boards. *Administrative Science Quarterly*, 45(2), pp.366–398. Available at: <https://doi.org/10.2307/26667075>
- Yasser, Q.R., Al Mamun, A. and Rodrigs, M. (2017). Impact of board structure on firm performance: evidence from an emerging economy. *Journal of Asia Business Studies*, 11(2). Available at: <https://doi.org/10.1108/JABS-06-2015-0067>
- Younas, N., UdDin, S., Awan, T. and Khan, M.Y. (2021). Corporate governance and financial distress: Asian emerging market perspective. *Corporate Governance*, 21(4), pp. 702-715. Available at: <https://doi.org/10.1108/CG-04-2020-0119>
- Yousaf, U.B., Jebran, K. and Wang, M. (2021). Can board diversity predict the risk of financial distress?. *Corporate Governance*, 21(4), pp. 663-684. Available at: <https://doi.org/10.1108/CG-06-2020-0252>